

forming a thin film used for forming the passivation section on the light shielding section and the aperture; and

flattening a surface of the thin film to form the passivation section by chemical machine polishing.

REMARKS

Claims 1 through 14 are pending in the subject application. Claims 1-5 and 7-14 stand rejected under 35 U.S.C. 103(a). Claim 6 has been allowed. Claims 1, 5, 7, and 8 have been amended.

The Applicant appreciates the Examiner's thorough examination of the subject application and respectfully requests reconsideration of the subject application based on the above amendments and the following remarks.

35 U.S.C. § 103(a) REJECTIONS

The Examiner has rejected claims 1-4, 8-11, and 13 under 35 USC 103(a) as being unpatentable over the prior art in view of U.S. Patent Number 6,396,089 to Lin, et al. ("Lin" or the "Lin Reference") and claims 5, 7, 11, 12, and 14 under 35 USC 103(a) as being unpatentable over the prior art in view of Lin further in view of published European patent application EP 0 887 847 A1 to DeSanti, et al. ("DeSanti" of the "DeSanti Reference"). The Applicant respectfully traverses these rejections based on the above amendments and for reasons detailed below.

Claims 1-4, 8-11, and 13

The Examiner asserts that, the admitted prior art discloses all of the features of the invention as claimed except for a planar/flat top surface, which the Examiner maintains is taught by the Lin Reference.

The present invention discloses that, non-planar, e.g., stepped, passivation films 15 make it difficult to converge incident light on the light reception section 12 because non-planar, e.g., stepped, surfaces reflected and refracted light. See, e.g., Specification page 8, line 7 to page 9, line 9. Furthermore, because the refractive index of the passivation film is greater than the refractive index of the overlying planarization film, "total internal reflection can occur at the interface between the planarization film 16 and a face of the passivation film 14." Id., page 6, lines 16-19. As a result, light incident of the interface is not converged on the light reception section 12. See, e.g., Id., page 6, line 22 to page 7, line 2.

Accordingly, the Applicant provides a planarization section immediately overlying a passivation section "having a substantially flat top surface" to eliminate non-planar, e.g., stepped, surface that otherwise might cause reflected and refracted light. See, e.g., Id., page 15, lines 14-22.

In contrast, the Lin reference discloses an image sensor having bonding pads 302 that are covered by a non-planar, oxide passivation layer 304. An SOG planarization layer 306 overlies the non-planar passivation layer 304 and a thin, oxide layer 308 promotes adhesion of a second, planar passivation layer 310 to the planarization layer 306. Thus, Lin teaches a planarization layer disposed between a pair of passivation layers 304 and 310: one of which is non-planar and the other is planar.

However, as provided in the specification of the invention as claimed, total internal reflection at the non-planar interface between the overlying planarization film and the passivation film can result in insufficient sensitivity because light incident on the interface is not converged on the light reception section, which is the problem addressed by the present invention.

Indeed, the Lin reference does not teach, mention or suggest a planarization section overlying the substantially flat top surface of the passivation layer or a method

for producing the same that so requires. Therefore, it is respectfully submitted that, claims 1-4, 8-11, and 13 are not made obvious by the admitted prior art in view of Lin and, further, satisfy the requirements of 35 U.S.C. 100, et seq., especially § 103(a). Accordingly, claims 1-4, 8-11, and 13 are allowable. Moreover, it is respectfully submitted that the subject application is in condition for allowance. Early and favorable action is requested.

Claims 5, 7, and 12

Nor can the DeSanti reference make up for the deficiencies of the admitted prior art and Lin references. Specifically, DeSanti does not teach, mention or suggest providing a planarization section immediately overlying a passivation section "having a substantially flat top surface" to eliminate non-planar, e.g., stepped, areas that otherwise might cause reflected and refracted light.

Therefore, it is respectfully submitted that, claims 5, 7, and 12 are not made obvious by the admitted prior art in view of Lin further in view of DeSanti and, further, satisfy the requirements of 35 U.S.C. 100, et seq., especially § 103(a). Accordingly, claims 5, 7, and 12 are allowable. Moreover, it is respectfully submitted that the subject application is in condition for allowance. Early and favorable action is requested.

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The Applicant believes that no additional fee is required for consideration of the within Response. However, if for any reason the fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge Deposit Account No. **04-1105**.

Respectfully submitted,

Date: December 2, 2003

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